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PATENT
CR00-036

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Talin et al. Group Art Unit: 2879
Application No.: 09/940756 Examiner: K. Ramsey
Date Filed: 28 August 2001
Title: METHOD FOR ACTIVATING NANOTUBES AS FIELD EMISSION SOURCES

CERTIFICATE OF MAILING

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12-17-03

DATE

INFORMATION DISCLOSURE STATEMENT (IDS)

Assistant Commissioner For Patents
Washington, D.C. 20231

SIR:

In accordance with 37 C.F.R. §1.56 and in compliance with 37 C.F.R. §§1.97 and 1.98, the references listed on attached Form PTO/SB/08 and/or subsequently identified herein, are being submitted herewith for consideration by the United States Patent and Trademark Office.

I. COPIES

- a. ☒ A legible copy of (i) each U.S. and foreign patents; (ii) each publication or that portion which caused it to be listed; and (iii) all other information or that portion which caused it to be listed, is included herewith.
- b. ☐ Any patents, publications or other information which are listed on PTO/SB/08 which are not enclosed herewith were previously cited by or submitted to the PTO in one of the following applications which has been relied upon for an earlier filing date under 35 U.S.C. §120:

U.S. Serial Number

U.S. Filing Date

II. CONCISE EXPLANATION OF THE RELEVANCE (check at least one box)

- a. ☒ Except as may be indicated below in (b) of this section, all of the patents, publications or other information are in the English language (concise explanation not required).
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- c. ☐ The following additional information is provided for the Examiner's consideration:

III. ☐ CROSS REFERENCE TO RELATED APPLICATION(S)

The Examiner is advised that the following co-pending application(s) contain(s) subject matter that may be related to the present application. By bringing this (these) applications to the Examiner's attention, Applicant(s) does(do) not waive the confidentiality provisions of 35 U.S.C. §122.

Serial No.

Filing Date

Art Unit

12/31/2003 00000072 502117 09940756

03 FC:1006 100.00 BA

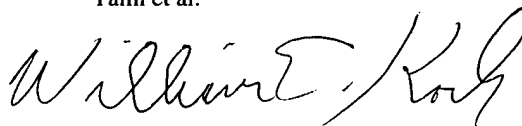
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- IV. ☐ THIS IDS IS BEING FILED UNDER 37 C.F.R. §1.97(b): (check one box)
- a. ☐ within three months of the filing date of a national application other than a continued prosecution application under § 1.53(d) (37 C.F.R. §1.97(b)(1)). No fee or statement is required.
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 - c. ☐ before the mailing date of a first Office Action on the merits (37 C.F.R. §1.97(b)(3)). No fee or statement is required.
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- a. ☒ No statement; therefore, charge deposit account 502117 the fee set forth in 37 C.F.R. §1.17(p).
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- 1) a statement under 37 C.F.R. §1.97(e) as provided below; and
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- VII. ☐ STATEMENT UNDER 37 C.F.R. §1.97(e) (check only one box, if applicable)
The undersigned hereby states that
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- ☐ A check in the amount of _____ is enclosed for the above-identified fee(s).
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 - ☒ If Applicant has overlooked any additional fees, or if any overpayment has been made, the Commissioner is hereby authorized to credit or debit Deposit Account 502117.
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The above references are being cited only in the interests of candor and without any admission that they constitute statutory prior art or contain matter which anticipates the invention or which would render the same obvious, either singly or in a combination, to a person of ordinary skill in the art.

If the Examiner has any questions concerning this IDS, he/she is requested to contact the undersigned. If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule (with a petition if necessary) and charge the appropriate fee to Deposit Account No. 502117

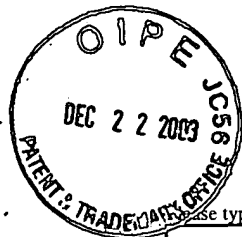
Respectfully submitted,
Talin et al.



William E. Koch
Attorney for Applicant(s)
Reg. No. 29,659
Tel. 602-952-3486

MOTOROLA, INC.
Customer Number 23330

Enclosures: ☒ PTO/SB/08
☒ References
☐ Foreign Search Report
☐ Other:



PATENT
CR00-036

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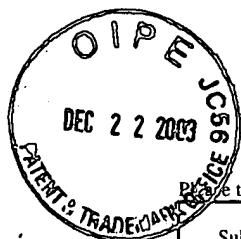
Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)		<u>Complete if Known</u>			
		Application Number	09/940756		
		Filing Date	28 August 2001		
		First Named Inventor	Talin et al.		
		Group Art Unit	2879		
		Examiner Name	K. Ramsey		
Sheet	2	of	4	Attorney Docket Number	CR00-036

OTHER PRIOR ART – NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	4	Xu et al., "A method for fabricating large-area, patterned, carbon nanotube field emitters," Applied Physics Letters, Vol. 74, No. 17, 26 April 1999, pp. 2549-2551.	
	5	Fan et al., "Self-oriented regular arrays of carbon nanotubes and their field emission properties," Science, Vol. 283, 22 January 1999, pp. 512-514.	
	6	Suh et al., "Highly ordered two-dimensional carbon nanotube arrays," Applied Physics Letters, Vol. 75, No. 14, 4 October 1999, pp. 2047-2049.	
	7	Hernadi et al. "Catalytic synthesis of carbon nanotubes using zeolite support," Zeolites 17, 1996, pp. 416-423.	
	8	Murakami et al., "Field emission from well-aligned, patterned, carbon nanotube emitters," Applied Physics Letters, Vol. 76, No. 13, 27 March 2000, pp. 1776-1778.	
	9	Ma et al., "Polymerized carbon nanobells and their field-emission properties," Applied Physics Letters, Vol. 75, No. 20, 15 November 1999, pp. 3105-3107.	
	10	Li et al., "Highly-ordered carbon nanotube arrays for electronics applications," Applied Physics Letters, Vol. 75, No. 3, 19 July 1999, pp. 367-369.	
	11	Terrones et al., "Controlled production of aligned-nanotube bundles," Nature, Vol. 388, 3 July 1997, pp.52-55.	
	12	Xu et al., "Controlling growth and field emission property of aligned carbon nanotubes on porous silicon substrates," Applied Physics Letters, Vol. 75, No. 4, 26 July 1999, pp. 481-483.	
	13	Tsai et al., "Bias-enhanced nucleation and growth of the aligned carbon nanotubes with open ends under microwave plasma synthesis," Applied Physics Letters, Vol. 74, No. 23, 7 June 1999, pp. 3462-3464.	
	14	Kind et al., "Patterned films of nanotubes using microcontact printing of catalysts," Advanced Materials, 11, No. 15, 1999, pp. 1285-1289.	

Examiner Signature		Date Considered	
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PATENT
CR00-036

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Examiner Name	K. Ramsey				
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	15	Nilsson et al., "Scanning field emission from patterned carbon nanotube films." Applied Physics Letters, Vol. 76. No. 15, 10 April 2000, pp. 2071-2073.	
	16	Kuttel et al, "Electron field emission from phase pure nanotube films grown in a methane/hydrogen plasma," Applied Physics Letters, Vol. 73, No. 15, 12 October 1998, pp. 2113-2115.	
	17	Ren et al., "Synthesis of large arrays of well-aligned carbon nanotubes on glass," Science, Vol. 282 6 November 1998, pp. 1105-1107.	
	18	Ren et al. "Growth of a single freestanding multiwall carbon nanotube on each nanonickel dot," Applied Physics Letters, Vol 75, No. 8 23 August 1999, pp. 1086-1088.	
	19	Pan et al., "Very long carbon nanotubes," Nature, Vol. 394, 13 August 1998, pp. 631-632.	
	20	Zhang et al., "A flat panel display device fabricated by using carbon nanotubes cathode," IEEE, 2001, pp. 193-194.	
	21	Zhong et al., "Large-scale well aligned carbon nitride nanotube films: Low temperature growth and electron field emission," Journal of Applied Physics, Vol. 89, No. 11, 1 June 2001, pp. 5939-5943.	
	22	Kim et al., "Growth and field emission of carbon nanotubes on electroplated Ni catalyst coated on glass substrates," Journal of Applied Physics, Vol. 90, 1 September 2001, pp.2591-2594.	
	23	Gulyaev et al., "Field emitter arrays on nanotube carbon structure films," J. Vac.Sci. Technol. B 13(2), Mar/Apr 1995, pp. 435-436.	
	24	Chernozatonskii, et al. "Nanotube carbon structure tips – a source of high field emission of electrons," Mat. Res.Soc. Symp. Proc., Vol. 359. 1995 Materials Research Society, pp. 99-104.	
	25	Su et al., "A scalable CVD method for the synthesis of single-walled carbon nanotubes with high catalyst productivity," Chemical Physics Letters 322, (2000), pp 321-326.	

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	26	Li et al. "Large-scale synthesis of aligned carbon nanotubes," Science, Vol. 274, 6 December 1996, pp. 1701-1703	
	27	Cassell et al. "Large scale CVD synthesis of single-walled carbon nanotubes," J. Phys. Chem. B. 1999, 103, pp. 6484-6492.	
	28	Cassell et al. "Directed growth of free-standing single walled carbon nanotubes," J. Am. Chem. Soc. 1999, 121, pp. 7975-7976.	
	29	Cassell et al, "Combinatorial optimization of heterogeneous catalysts used in the growth of carbon nanotubes," Langmuir 2001, 17, pp. 260-264.	
	30	Li et al, "Large-scale synthesis of aligned carbon nanotubes," Science, Vol. 274, 6 December 1996, pp. 1701-1703.	

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C

DOCKET NO.:		CR00-036		IDS	
APPLICANT(S)		TRUJILLO ET AL.		GROUP ART UNIT: 2811	
APPLN. NO.:		09/940756			
FILED:		AUGUST 28, 2001		EXAMINER:	
TITLE:		NANOTUBES ACTIVATED AS FIELD EMISSION SOURCES			
				BATCH	
1.	1	Return Postal Card			
2.	1	Transmittal Form			
3.		Fee Transmittal (in duplicate)			
4.	1	PTO/SB/08 and cited art			
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Mailed: 5-6-03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Trujillo et al. Group Art Unit: 2811
Application No.: 09/940756 Examiner:
Date Filed: August 28, 2001
Title: NANOTUBES ACTIVATED AS FIELD EMISSION SOURCES

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Serial No.

Filing Date

Art Unit

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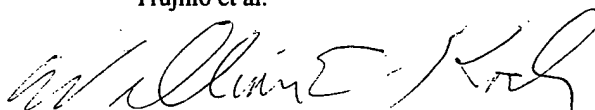
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- VII. ☐ STATEMENT UNDER 37 C.F.R. §1.97(e) (check only one box, if applicable)
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PATENT
CR00-036

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Respectfully submitted,
Trujillo et al.



William E. Koch
Attorney for Applicant(s)
Reg. No. 29,659
Tel. 602-952-3486

MOTOROLA, INC.
Customer Number 23330

Enclosures:

☒
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PTO/SB/08
References
Foreign Search Report
Other:

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				<i>Complete if Known</i>	
				Application Number	09/940756
				Filing Date	August 28, 2001
				First Named Inventor	Trujillo et al.
				Group Art Unit	2811
				Examiner Name	
Sheet	1	of	2	Attorney Docket Number	CR00-036

[illegible][illegible]

Examiner Signature		Date Considered	
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(use as many sheets as necessary)

Sheet	2	of	2
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Complete if Known

Application Number	09/940756
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Filing Date	August 28, 2001
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First Named Inventor	Trujillo et al.
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Group Art Unit	2811
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Examiner Name

Attorney Docket Number	CR00-036
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B.H. Fishbine, "Carbon nanotube alignment and manipulation using electrostatic fields," *Fullerene Science & Technology*, 1996, pp. 87-100

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